UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,453	01/27/2004	Yasuhiro Yamamoto	P24456	8676

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EXAMINER
LE, TUAN H

ART UNIT	PAPER NUMBER
2622	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/05/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/05/2007.

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gbpatent@gbpatent.com
pto@gbpatent.com

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *January 27, 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3* is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 2* is/are rejected.

7)☒ Claim(s) *3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☒ All   b)☐ Some * c)☐ None of:

　　　　1.☒ Certified copies of the priority documents have been received.

　　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d),

which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Easwar et al (U.S. Pat. 6,825,876 B1) and further in view

of Sugimori (U.S. Pub. 2003/0067548 A1) and Sasai (U.S. Pat. 6,636,629 B1).

Regarding **claim 1**, Easwar et al discloses a false-color reducing device

comprising:

a raw data reading processor (image processor 102 and central processor

106) that reads a raw data, in which a first row and a second row are arranged

alternately in a vertical direction, said first row being formed by arranging a first

pixel representing red (R) data and a second pixel representing green (G) data

alternately in a horizontal direction, said-second row being formed by arranging

said second pixel and a third pixel representing blue (B) data alternately in the

horizontal direction, (see Easwar et al, Fig. 1A, Fig. 5, column 2 lines 34-38,

column 11 lines 37-39 and column 21 lines 37-40, wherein the image processor

102 reads out pixel data from a Bayer-mosaic-pattern image sensor);

a first interpolation processor (central processor 106) that performs an

interpolation on said raw data to generate R plane data in which all the pixels

have said R data, G plane data in which all the pixels have said G data, and B

plane data in which all the pixels have said B data, (see Easwar et al, Fig. 1A,

Fig. 3A step 323, column 21 lines 61-62, and column 22 lines 17-20, wherein

color planes are seperated);

a color difference data calculation processor (central processor 106) that

calculates U data and V data, which are color difference data, regarding said

first, second, and third pixels, using said R plane data, said G plane data, and

said B plane data, (see Easwar et al, Fig. 1A, column 29 lines 1-20, wherein U

and V data are calculated);

However, Easwar et al does not disclose a second interpolation processor

that calculates a mean value of said V data of four pixels adjacent to said first

pixel in oblique directions, and sets this mean value as replacement V data for

said first pixel.

On the other hand, Sugimori discloses that for a mean value of an

interested red color of a center pixel, the mean is calculated by red colors of four

pixels adjacent to the center pixel, (see Sugimori, Fig. 13, wherein

R43=(R32+R34+R52+R54)/4).

Therefore, it would have been obvious to one of ordinary skills in the art at

the time the invention was made to implement the interpolation processor as

described by Sugimori into the false-color reducing device as described by

Easwar et al in order to calculate V data for the first R pixel because such

implementation results in high-resolution image data and an effect to reduce the

false color can be attained, (see Sugimori, paragraph [0009]).

However, Easwar et al does not disclose a third interpolation processor

that calculates a mean value of said U data of four pixels adjacent to said third

pixel in oblique directions, and sets this mean value as replacement U data for

said third pixel.

On the other hand, Sasai discloses an interpolation unit (4), (see Sasai,

Fig. 1, wherein the interpolation unit adjusts B data), that calculates a mean

value of B data of four pixels adjacent to an interested pixel in oblique directions,

and sets this mean value as replacement B data for said interested pixel, (see

Sasai, Figs. 2A-2C, wherein oblique pattern is used for an interested pixel

$B33=(B22+B42+B24+B44)/4$).

Therefore, it would have been obvious to one of ordinary skills in the art at

the time the invention was made to implement the interpolation unit as described

by Sasai into the false-color reducing device as described by Easwar et al and

Sugimori in order to calculate U data for the third B pixel because such

implementation results in high-quality image without performing complicated pixel

interpolation, (see Sasai, column 2 lines 40-42).

As for **claim 2**, as previously mentioned in the discussion of claim 1,

Easwar et al, Sugimori, and Sasai disclose all of the limitations of the parent

claim. However, none of Easwar et al, Sugimori, and Sasai discloses a fourth

interpolation processor that calculates mean values of said V data and said U

data of four pixels adjacent to the upper, lower, right, and left sides of said

second pixel, and sets these mean values as replacement U data and V data for

said second pixel.

On the other hand, Sasai discloses an interpolation unit (4), (see Sasai,

Fig. 1, wherein the interpolation unit adjusts G data), that calculates a mean

value of G data of four pixels adjacent to the upper, lower, right, and left sides of

an interested pixel, and sets this mean value as replacement G data for said

interested pixel, (see Sasai, Figs. 2A-2C, wherein upper, lower, right, and left

sides of an interested pixel are used for mean value calculation

$G33=(G32+G23+G43+G34)/4$).

Therefore, it would have been obvious to one of ordinary skill in the art at

the time the invention was made to implement the interpolation unit as described

by Sasai in to the false color reducing device as described by Easwar et al,

Sugimori, and Sasai in order to calculate mean values for V and U data because

such implementation results in high-quality image without performing complicated

pixel interpolation, (see Sasai, column 2 lines 40-42).

Allowable Subject Matter

Claim 3 is objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form including all of the limitations

of the base claim and any intervening claims. More specifically, the prior art of

record neither anticipates nor renders obvious the limitation that at a green pixel,

V and U values are calculated on the basis of V and U values of neighboring red and blue pixels.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Hunter et al (U.S. Pub. 2003/0086606) discloses the reconstruction of a color plane in image mosaic data with correction for color aliasing artifacts. The reconstruction results in a de-mosaic color image with reduced or eliminated color aliasing along edges.

Chen (U.S. Pub. 6,570,616 B1) discloses a method for processing an image of a two-dimensional pixel arrangement such as a Bayer arrangement. According to Chen, when an edge component is detected, the weight of the reference pixels is changed at the top, bottom, left, and right.

Kakarala et al (2003/0052981 A1) discloses an adaptive demosaicing method that interpolates images based on color edge detection and neighborhood voting.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Le whose telephone number is (571) 270-1130. The examiner can normally be reached on M-Th 7:30-5:00 F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tuan Le
March 26, 2007.

DAVID OMETZ
SUPERVISORY PATENT EXAMINER